

**SEMICONDUCTOR DEVICE**

Patent number: JP1313942  
Publication date: 1989-12-19  
Inventor: OIKAWA AKIRA; others: 01  
Applicant: FUJITSU LTD  
Classification:  
- international: H01L21/312; H01L21/90  
- european:  
Application number: JP19880144841 19880614  
Priority number(s):

**Abstract of JP1313942**

**PURPOSE:** To form a multilayer interconnection in high reliability by a method wherein a double layer structured interlayer insulating film comprising a resin layer capable of flattening an underneath stepped part is used as a lower layer and another resin layer in excellent oxidation resistance as an upper layer.

**CONSTITUTION:** An applicable interlayer insulating film is double layer structured, i.e. the lower layer insulating film comprises an organic silicon polymer capable of flattening an underneath stepped part while the upper layer insulating film comprises an aryl group containing organic silicon polymer with oxidation resistance. Such a double layer structured interlayer insulating film can flatten the surface of semiconductor substrate having rugged surface and can maintain the film quality thereof subject to no crack or release even if it is exposed to the oxygen atmosphere exceeding 400 deg.C or oxygen radical in high concentration or oxygen ionic atmosphere. Through these procedures, a multilayer interconnection of high reliability can be formed.

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**PRODUCTION OF URETHANIZED POLYSILOXANE**

Patent number: JP2000615  
Publication date: 1990-01-05  
Inventor: ERIYAMA YUICHI; others: 02  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- International: C08G18/61; C08G77/458  
- european:  
Application number: JP19880090334 19880414  
Priority number(s):

**Abstract of JP2000615**

**PURPOSE:** To obtain the present polysiloxane excellent in heat resistance, hydrolysis resistance, electrical insulation properties, transparency, etc., and useful for a coating material, a heat-resistant, insulating, water-resistant protective film, etc., by reacting a polysiloxane with a cyclic silane compound and a polyisocyanate compound.

**CONSTITUTION:** A urethanized polysiloxane is produced by reacting a polysiloxane having a silanol group in the molecule (e.g., polydimethylsilicone having silanol groups on both ends) with a cyclic silane compound of the formula (wherein R<1> and R<2> are each H, a halogen atom, an alkyl, an aryl, an alkoxy or an amino; and R<3> is a bivalent organic group bonded to the Si atom through C), e.g., 1,1-dimethyl-1-sila-2-oxacyclohexane, and a polyisocyanate compound (C) (e.g., 2,4-tolylene diisocyanate). The obtained polysiloxane excels in heat resistance, hydrolysis resistance, electrical insulation properties, transparency, etc., and is useful for a coating material, a heat-resistant, insulating, water-resistant protective film, an adhesive, an optical fiber coating agent, a surfactant, a mold release, etc.

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**POLYORGANOSILOXANE THERMOPLASTIC RESIN**

Patent number: JP2008209  
Publication date: 1990-01-11  
Inventor: KURATA TAKASHI; others: 06  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD; others: 01  
Classification:  
- international: C08F283/12  
- european:  
Application number: JP19880105956 19880429  
Priority number(s):

**Abstract of JP2008209**

**PURPOSE:** To obtain the subject resin having excellent sliding property, abrasion resistance, weather resistance, freeze resistance, impact resistance, etc., and suitable as a part to be used in cold district, etc., by condensing an organosiloxane with a specific graft-crosslinking agent and graft-polymerizing a vinyl monomer.

**CONSTITUTION:** A modified polyorganosiloxane is produced by condensing (A) 90-99.8wt.% of an organosiloxane having the structural unit of formula I ( $R<1>$  is substituted or unsubstituted hydrocarbon group;  $n$  is 0-3) (e.g., hexamethylcyclotrisiloxane) and (B) 10-0.2wt.% of a graft-crosslinking agent containing an unsaturated group of formula II ( $R<2>$  is H or 1-6C alkyl) and an alkoxysilyl group (e.g., p-vinylphenylmethyldimethoxysilane). The obtained polyorganosiloxane is graft-polymerized with (C) a vinyl monomer (e.g., styrene) to obtain the objective resin containing the component C accounting for preferably 95-20wt.% of the whole polymer composition.

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**PRODUCTION OF PHOTSENSITIVE HEAT RESISTANT RESIN COMPOSITION  
AND INSULATING LAYER**

Patent number: JP2099955  
Publication date: 1990-04-11  
Inventor: SHIBA SHOJI; others: 02  
Applicant: FUJITSU LTD  
Classification:  
- international: G03F7/075; H01L21/027; H01L21/312  
- european:  
Application number: JP19880252503 19881006  
Priority number(s):

**Abstract of JP2099955**

**PURPOSE:** To put the resin compsn. having photosensitivity and excellent heat resistance to practical use and to form fine patterns by using a resist consisting of specific polyorganosilcesquioxane and a photosensitizing agent as the upper layer resist of a two-layered structure.

**CONSTITUTION:** The mixture composed of the polyorganosilcesquioxane expressed by the formula I and the photosensitizing agent is used as the upper layer resist of the two-layered structure. In the formula I, R1 denotes 2 to 4C alkenyl group; R2 denotes an arom. group or substd. arom. group; R3, R4 denote 2 to 4C alkenyl group, arom. group or substd. arom. group; R5- to R7 denote 1 to 4C alkyl group, 2 to 4C alkenyl group, arom. group or substd. arom. group; l, m denote 1 to 100000 positive integer. The formation of the fine patterns is possible in this way and the insulating layer having the sufficient heat resistance and crack resistance is formed.

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**RESIST COMPOSITION CONSISTING OF ORGANIC SILICONE POLYMER**

Patent number: JP2110464  
Publication date: 1990-04-23  
Inventor: WATABE KEIJI; others: 04  
Applicant: FUJITSU LTD  
Classification:  
- international: G03F7/075; C08G77/60; H01L21/027  
- european:  
Application number: JP19880263186 19881019  
Priority number(s):

**Abstract of JP2110464**

**PURPOSE:** To put the upper layer resist of two-layered structures having excellent oxygen plasma etching resistance and sensitivity into practicability by dissolving specific polyorganosil alkylenedisiloxane into an org. solvent to constitute the resist compsn.

**CONSTITUTION:** The resist compsn. formed by dissolving the polyorganosil alkylenedisiloxane expressed by formula I into the org. solvent is used. In formula I, R1, R2 denote 2 to 6C alkenyl group, 1 to 5C alkyl group or aryl group, R3 denotes an alkylene group, m, n are respectively 0 to 10,000 integer and  $m+n \geq 10$ . This polyorganosil alkylenedisiloxane is introduced with an alkenyl group as a functional group and not only, therefore, reacts with electron beams but also has the high reactivity with X-rays, far UV light, UV light and visible light. The upper layer resist of the two-layered structures having the excellent sensitivity, resolution and oxygen plasma resistance is obtd. in this way and the accuracy of integrated circuits is improved.

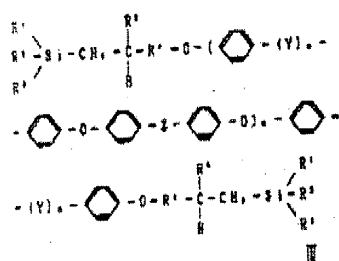
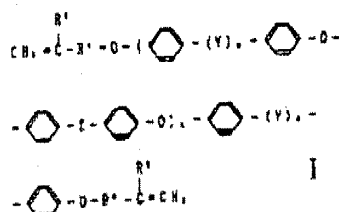
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## SILYLATED POLYETHER

Patent number: JP2124936  
 Publication date: 1990-05-14  
 Inventor: ERIYAMA YUICHI; MATSUMURA YOSHIO  
 Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
 Classification:  
 - international: C08G65/48  
 - european:  
 Application number: JP19880277409 19881104  
 Priority number(s): JP19880277409 19881104

## Abstract of JP2124936

**PURPOSE:** To obtain a silylated polyether improved in heat resistance and adhesion without detriment to the properties of the polyether by reacting a specified terminally unsaturated polyether with an organosilicon compound. **CONSTITUTION:** A terminally unsaturated polyether (a) of formula I (wherein R<4> is a bivalent organic group; R<5> is H or methyl; Y and Z are each a bivalent group composed of at least one atom selected from among C, O, S, H and F; m is 0 or 1; and n is 0-1000), having a number-average MW of 500-1000000 (in terms of PS), is reacted with 2-50mol, per mol of the polyether, of an organosilicon compound (b) of formula II (wherein R<1-3> are each a hydrolyzable group, a hydroxyl group, alkyl, aryl or aralkyl and at least one of R<1-3> is a hydrolyzable group or a hydroxyl group) at 0-200 deg.C in a reducing or inert gas atmosphere in the presence of, optionally, 0.0001-0.1wt.%, based on component (a), catalyst (e.g., dibutyl-tin dilaurate) to obtain a silylated polyether of formula III.



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## POLYMETHYLSILSESQUIOXANE POWDER HAVING TREATED SURFACE

Patent number: JP2150426

Publication date: 1990-06-08

Inventor: SAITO KENJI; KIMURA HIROSHI; MUTO HIDEAKI

Applicant: TOSHIBA SILICONE

## Classification:


- international: C07F7/12; C08J3/12; C08L83/04

- european: C08J3/12

Application number: JP19880303941 19881202

Priority number(s): JP19880303941 19881202

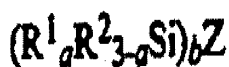
Also published as:

 US5106922 (A1)

## Abstract of JP2150426

PURPOSE: To obtain polymethylsilsesquioxane powder, excellent in water repellency and suitable as additives for preventing molding materials for sealing semiconductors from absorbing moisture by treating the surface of the powder with an organosilicon compound having a polyfluoroalkyl group linked to silicon atom.

CONSTITUTION: The surface of polymethylsilsesquioxane powder is treated with a compound expressed by the formula  $(R^1_a R^2_{3-a} Si)_b Z$  is polyfluoroalkyl [e.g.  $R^{<4>}Q$ - ( $R^{<4>}$  is 1-20C perfluoroalkyl; Q is 2-6C alkylene)];  $R^{<2>}$  is unsubstituted monofunctional hydrocarbon, preferably 1-4C alkyl; a is 1-3; b is 1 or 2; Z is H, halogen, OH,  $NR^{<3>}X$  ( $R^{<3>}$  is 1-4C alkyl; X is H or  $R^{<3>}$ ), etc., when b is 1 and O, NX or S when b is 2). The above-mentioned powder is preferably respectively independent and nearly spherical and contains  $\geq 80\%$  particles having a particle diameter within the range of the average particle diameter  $\pm$  or  $-30\%$  thereof.



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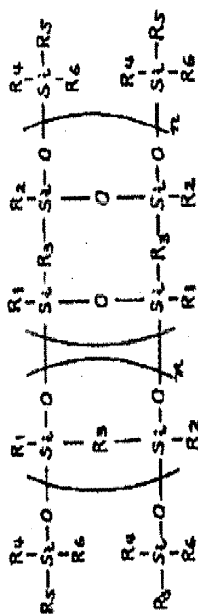
## RESIST PATTERN FORMING METHOD

Patent number: JP2163744  
 Publication date: 1990-06-25  
 Inventor: WATABE KEIJI; SAITO KAZUMASA; SHIBA SHOJI  
 Applicant: FUJITSU LTD  
 Classification:  
 - international: G03F7/075; G03F7/095; H01L21/027  
 - european:  
 Application number: JP19880319783 19881219  
 Priority number(s): JP19880319783 19881219

## Abstract of JP2163744

**PURPOSE:** To improve shelf stability, to increase workability and to reduce cost by using polyorganosilalkylenedisiloxane having organosilylated terminal hydroxyl groups as the upper resist of a two-layered resist.

**CONSTITUTION:** When a substrate having difference in level is patterned by photoetching technology, a two-layered resist is used. The surface of the substrate is first flattened with the lower layer resist, the upper layer resist having superior resistance to dry etching with oxygen is formed on the lower layer resist and patterned and then the lower layer resist is dry-etched with the patterned upper layer resist as a mask to form a fine pattern. The above two layered resist is used for the resist pattern. The terminal hydroxyl groups of polyorganosilalkylenedisiloxane having shelf stability for about 3 months are organosilylated and the resulting siloxane having stability over a long period of time is used as the upper layer resist. Workability is increased and cost can be reduced.





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**INSULATING LAYER OF SILSESQUOXANE FLATTENED LADDER POLYMER****Patent number:** JP2178330**Publication date:** 1990-07-11**Inventor:** DONA JIIN KURODOGOU; ROOZUMARII AN  
PUREBITEIKERII; RONARUDO ROBAATO  
YUTEKUTO; ERITSUKU GUREGORII UOORUTON**Applicant:** IBM**Classification:****- international:** C08G77/26; H01B3/46; H01L21/312**- european:** H01L21/312B; H01L21/312B2; H01L23/29P**Application number:** JP19890280030 19891030**Priority number(s):** US19880276597 19881128

Also published as:

 EP0371287 (A1) US4981530 (A1)

Abstract not available for JP2178330

Abstract of corresponding document: EP0371287

An improved insulation layer is formed by first preparing a solution by reacting water with an aminoalkoxysilane monomer in a solvent, using a critical mole ratio of water/monomer. After a sufficient aging period, the solution is coated onto a suitable surface, e.g. the surface of a semiconductor device, and then cured, in an essentially oxygen-free atmosphere, to a ladder-type silsesquioxane polymer. The insulation layer demonstrates excellent planarizing characteristics, while also exhibiting enhanced crack-resistance.

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**POLYFLUOROLEFIN-POLYORGANOSILOXANE GRAFT COPOLYMER AND PRODUCTION THEREOF**

Patent number: JP2308806  
Publication date: 1990-12-21  
Inventor: MATSUMOTO MAKOTO; YOSHIDA HIROFUMI;  
WATANABE JUNICHIRO; FUNAHASHI YUICHI; ZAMA  
YOSHIKI; UMEDA ITSUKI; KATAYAMA SEIZO  
Applicant: TOSHIBA SILICONE;; JAPAN SYNTHETIC RUBBER  
CO LTD  
Classification:  
- international: C08F283/12; C08F299/00  
- european:  
Application number: JP19890132086 19890525  
Priority number(s): JP19890132086 19890525

**Abstract of JP2308806**

**PURPOSE:** To obtain the subject copolymer having excellent heat resistance, cold resistance, oil resistance, strength and moldability by subjecting specific modified polyorganosiloxane and fluoroolefin monomer bonding with F on unsaturated bond of carbon atom to radical graft polymerization.

**CONSTITUTION:** (A) 5-80wt.% modified polyorganosiloxane having average compositional formula expressed by the formula  $[R<1>]$  is (substituted) monofunctional organic group and 0.02-10wt.% of  $R<1>$  is ethylenic unsaturated group;  $a$  is 1.80-2.02 and in a range of 100-10000 number of silicon atom is subjected to graft polymerization with (B) 95-20wt.% fluoroolefin monomer bonding with fluorine atom on carbon atom forming unsaturated bonding by initiator of radical polymerization to afford the aimed polyfluoroolefin- polyorganosiloxane graft copolymer.

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**ORGANOPOLYSILOXANE COMPOSITION**

Patent number: JP3007766  
Publication date: 1991-01-14  
Inventor: SHIMIZU TOMONOBU; others: 02  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- international: C08L83/04; C08G77/06; C09D183/04  
- european:  
Application number: JP19900049545 19900302  
Priority number(s):

**Abstract of JP3007766**

**PURPOSE:** To obtain a composition, containing a reaction product of a partial condensate of methylsilane and/or partial cocondensate of the methylsilane with an organoalkoxysilane with an alkoxysilane, excellent in hardness, heat resistance, etc., and preservation stability and suitable as coating materials, etc.

**CONSTITUTION:** A composition obtained by blending a reaction product of (A) 100 pts.wt. partial condensate of methylsilane expressed by formula I [X is halogen or OR<1> (R<1> is 1-5C alkyl, etc.)] and/or a partial cocondensate of the aforementioned methylsilane with one or more organoalkoxysilanes expressed by formula II (R<2> is 1-8C organic group; a is 0 or 2) and formula III (R<3> is 2-8C organic group) with (B) 1-25 pts.wt., preferably 2-15 pts.wt. alkoxysilane expressed by formula IV (R<4> is 3-10C organic group; b is 0 or 1) in other components. The above-mentioned reaction product is blended in an amount of 10-100wt.%, preferably 20-100wt.% based on the composition.

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**PRODUCTION OF MODIFIED EPOXY COMPOSITION**

Patent number: JP3026716  
Publication date: 1991-02-05  
Inventor: IWANAGA SHINICHIRO; others: 03  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- International: C08G59/14; C08L63/00  
- european:  
Application number: JP19890161837 19890623  
Priority number(s):

**Abstract of JP3026716**

**PURPOSE:** To obtain the subject composition, excellent in bonding strength, etc., and suitable as semiconductor sealing media by coagulating a partially crosslinked rubber-like random copolymer latex, regulating the residual volatile content to a specific value, then adding and dispersing the regulated latex in an epoxy group-containing compound and removing the residual volatile substances.

**CONSTITUTION:** A coagulant is added, etc., to coagulate a latex of a partially crosslinked rubber-like random copolymer (e.g. prepared by copolymerizing divinylbenzene, etc., with butadiene, etc., and/or acrylic acid, etc.) and the residual volatile content is regulated to 5-60wt.% by centrifugal dehydration, etc. The resultant coagulated copolymer is then added and dispersed in an epoxy group-containing compound and the residual volatile substances are removed (preferably to  $\leq 0.1$ wt.%) by vacuum drying, etc., to efficiently produce the objective composition containing rubber-like particles homogeneously dispersed in the form of particles in the epoxy compound.

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**PHOTOSENSITIVE RESIN COMPOSITION**

Patent number: JP3028852  
Publication date: 1991-02-07  
Inventor: SAKATA YOSHIKAZU; others: 01  
Applicant: OKI ELECTRIC IND CO LTD  
Classification:  
- international: G03F7/075; C08K5/07; C08L83/04  
- european:  
Application number: JP19890284181 19891031  
Priority number(s):

**Abstract of JP3028852**

**PURPOSE:** To enhance resistance to oxygen plasma and resolution by incorporating a base resin made of a specified polysilsesquioxane derivative and a photosensitive material made of diarylglyoxal having absorption in the far ultraviolet wavelength region.

**CONSTITUTION:** The photosensitive resin composition comprises the base resin made of the polysilsesquioxane derivative having one or both of an unsaturated group and an alkyl group and the photosensitive material made of diarylglyoxals or their monoacetal derivatives having absorption in the far ultraviolet wavelength region, thus permitting the photosensitive material to produce carbon radicals at high efficiency because of high absorption in the far ultraviolet wavelength region, the content of the photosensitive material necessary for forming a resist pattern to be reduced, and therefore, the obtained novel photosensitive resin composition to be superior in resistance to oxygen plasma and resolution.

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**ORGANOSILICON POLYMER**

Patent number: JP3031325  
Publication date: 1991-02-12  
Inventor: OIKAWA AKIRA; others: 01  
Applicant: FUJITSU LTD  
Classification:  
- international: C08G77/44; H01L21/312  
- european:  
Application number: JP19890164628 19890627  
Priority number(s):

**Abstract of JP3031325**

**PURPOSE:** To obtain an organosilicon polymer excellent in keeping stability and heat resistance by substituting terminal silanol groups of a polymer compound having specific polyorganosilsesquioxane as structural units with a compound having a specific diorganosiloxane structure.

**CONSTITUTION:** An organosilicon polymer, obtained by hydrolyzing an organotrichlorosilane expressed by formula I (RA is H, hydroxyl, etc.) and an organotrialkoxysilane expressed by formula II (Rc is 1-5C lower alkyl), subjecting the resultant hydrolyzates to dehydrating polycondensation, reacting the resultant polymer compound having a polyorganosilsesquioxane expressed by formula III (n is 10-50000) as structural units with a compound having a diorganosiloxane structure expressed by formula IV (RB is alkyl, etc.; m is 1-10) and substituting terminal silanol groups of the polymer compound and capable of readily forming films.

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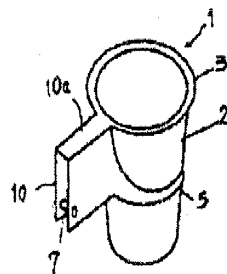
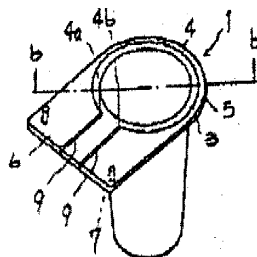
## CONTAINER

Patent number: JP3014456  
 Publication date: 1991-01-23  
 Inventor: SASAKI HITOSHI; others: 01  
 Applicant: AJINOMOTO CO INC; others: 01  
 Classification:  
 - international: B65D25/28  
 - european:  
 Application number: JP19890141556 19890602  
 Priority number(s):

## Abstract of JP3014456

**PURPOSE:** To form a gripping part simple in structure, easy to manufacture and excellent in stability feeding by a method wherein a container is provided with a wide part partially extending and surrounding its outer periphery and each side of the wide part is bent along the boundaries between itself and a flange extension while a band body is being forced down in order to form a grip part.

**CONSTITUTION:** A container 1 is composed of a container body 2 with a flange 3 formed around its top opening edge, C-shaped band body 5 provided along the flange 3 with an open space 4 and a flat plate-shaped, wide part 6 extending from each end of the band body 5 and connected by an extension from the flange 3 between opposite ends 4a and 4b of the open space 4. A pair of parallel notches 9 is formed extending from the opposite ends 4a and 4b of the open space to make the opposite sides of the wide part 6 bendable. The wide part 6 is bent downwards along the boundaries between itself and the flange extension to force the band body 5 down in order to surround therewith the lower outer periphery of the container body 2. Thus, the wide part 6 provides a grip part 10 having an upper face 10a as wide as the flange extension and oppositely positioned sides.



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**ORGANIC POLYMER-POLYSILOXANE COMPOSITE PARTICLE AND  
PREPARATION THEREOF**

Patent number: JP3045628  
Publication date: 1991-02-27  
Inventor: ITO NOBUYUKI; others: 03  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- international: C08G77/42; C08L101/00  
- european:  
Application number: JP19890182311 19890714  
Priority number(s):

**Abstract of JP3045628**

**PURPOSE:** To prepare polymer composite particles comprising a composite of an org. polymer with a polysiloxane by causing particles of the org. polymer dispersed in an aq. medium to absorb an alkoxysilane and then causing the alkoxysilane to polycondense.

**CONSTITUTION:** An alkoxysilane (e.g. methyltrimethoxysilane) is caused to be absorbed by particles of an org. polymer dispersed in an aq. medium (e.g. an emulsion-polymerized polystyrene latex having a mean particle diameter of 0.05-10 $\mu$ m) and is then caused to polycondense in the polymer particles, thus producing an aq. dispersion of polymer composite particles comprising a composite of the org. polymer with a polysiloxane easily at a high yield. The resulting polymer composite particles, given an excellent solvent, heat, and weathering resistance and adhesive properties inherent to the polysiloxane, can be used in many applications.

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**COATING COMPOSITION**

Patent number: JP3047883  
Publication date: 1991-02-28  
Inventor: SAKAGAMI TOSHIKI; others: 03  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- international: C09D183/04  
- european:  
Application number: JP19890303175 19891124  
Priority number(s):

**Abstract of JP3047883**

**PURPOSE:** To provide the subject composition containing an organo-alkoxysilane compound, etc., and a filler comprising manganese dioxide, etc., as a main component having excellent heat resistance, water resistance, chemical resistance, electric insulating property, adhesivity, hardness, cold heat cycle property, impact resistance, etc.

**CONSTITUTION:** The objective composition contains (A) an organoalkoxysilane of the formula (R is 1-8C organic group; R' is 1-5C alkyl or 1-4C acyl; n is 1 or 2), a hydrolysate thereof, a partial condensate thereof and/or a partial cocondensate thereof with a silane compound excluding the organo-alkoxysilane and (B) (i) a filler containing manganese dioxide as a main component or (ii) a filler containing a double oxide comprising the manganese dioxide and chromium trioxide as a main component. The composition has a far IR ray radiation efficiency and can form coating films having good flexural processability.

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**PRODUCTION OF THERMOPLASTIC POLYORGANOSILOXANE RESIN**

Patent number: JP3059016  
Publication date: 1991-03-14  
Inventor: KURATA TAKASHI; others: 05  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD; others: 01  
Classification:  
- International: C08F283/12  
- european:  
Application number: JP19890193994 19890728  
Priority number(s):

**Abstract of JP3059016**

**PURPOSE:** To produce the title resin which can give an oxygen permeable contact lens which is excellent in stain resistance without detriment to its oxygen permeability and hardness by grafting a specified vinyl monomer onto a modified polyorganosiloxane.

**CONSTITUTION:** A modified polyorganosiloxane (A) is obtained by polycondensing an organosiloxane having structural units of, for example, formula I [wherein R is an (un)substituted monovalent hydrocarbon group; and n is 0-3] and desirably having a ring structure with 0.1-50wt.% graft crosslinking agent of desirably formula II (wherein R<3> is H or a 1-6C alkyl) and having an unsaturated group and an alkoxysilyl group. Separately, a vinyl monomer component (B) is obtained by mixing a fluorinated (meth)acrylic ester of formula III [wherein R<1> is H or a methyl; R<2> is a linear or branched fluoro(oxy)alkyl having 2-23 F atoms or a fluorine-substituted aromatic group] with another vinyl monomer copolymerizable therewith. 95-10wt.% component B is grafted onto 5-90wt.% component A.

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**LATEX COMPOSITION**

Patent number: JP3064337  
Publication date: 1991-03-19  
Inventor: YONEKAWA YOSHIKI; others: 03  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- international: C08L9/00; C08K3/26; C08L9/00; C08L33/06;  
C09J109/10; D06M15/21; D06M17/06  
- european:  
Application number: JP1989020082 19890801  
Priority number(s):

**Abstract of JP3064337**

**PURPOSE:** To obtain an excellent blistering resistance and adhesive strength necessary for an adhesive compsn. for carpet backing by compounding a specific copolymer latex with an org. high molecular heat sensitizer and a bicarbonate salt.

**CONSTITUTION:** 100 pts.wt. (solid base) copolymer latex is compounded with 0.01-30 pts.wt. org. high molecular heat sensitizer and 0.03-5 pts.wt. bicarbonate salt. The copolymer latex is obtd. by emulsion polymerizing a monomer mixture comprising: 25-70wt.% at least one monomer selected from the group consisting of an aliph. conjugated diene, 2-10C alkyl acrylate, and 6-14C alkyl methacrylate; 0-5wt.% ethylenically unsatd. carboxylic acid; and 25-75wt.% other monomer copolymerizable with these two monomers. The copolymer latex has a glass transition temp. of +30 to -55 deg.C, a mean particle diameter of 600-2500Angstrom, and a gel content of 40-99wt.%.

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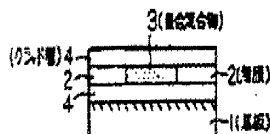
**ORGANIC OPTICAL WAVEGUIDE**

Patent number: JP3154007  
Publication date: 1991-07-02  
Inventor: HOSOYA TOSHIFUMI; others: 04  
Applicant: SUMITOMO ELECTRIC IND LTD  
Classification:  
- international: G02B6/12; B29D11/00; C08F2/46  
- european:  
Application number: JP19890292377 19891113  
Priority number(s):

**Abstract of JP3154007**

**PURPOSE:** To obtain the waveguide which is small in light transmission loss particularly in a long wavelength region of  $\geq 1.3\mu\text{m}$  by using a silicone resin as the constituting material of the optical waveguide.

**CONSTITUTION:** A clad layer 4 of the silicone resin is applied on a substrate 1 and a polymerized mixture 3 composed of the uncured silicone resin (soln.), an org. monomer and a photopolymer. initiator is applied thereon. The mixture 3 is irradiated with UV rays through a photomask having a desired waveguide patterns. Only the core part 3 is transmitted with UV rays and the core part 3 is formed if the refractive index of the monomer is higher than the refractive index of the silicone resin. The waveguide is completed by applying a clad layer 4 at need. The waveguide of the low loss to the light of the wavelengths as long as  $1.3\mu\text{m}$  and  $1.55\mu\text{m}$  mainly used in long-distance communication at present is thus obtd.



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**THERMOPLASTIC RESIN COMPOSITION**

Patent number: JP3162441  
Publication date: 1991-07-12  
Inventor: KURATA TAKASHI; others: 03  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- international: C08L51/04; C08L51/08  
- european:  
Application number: JP19890300882 19891121  
Priority number(s):

**Abstract of JP3162441**

**PURPOSE:** To obtain a thermoplastic resin composition, consisting essentially of a specific hydrogenated rubber-based thermoplastic resin and specific polyorganosiloxane-based thermoplastic resin and having excellent weather and impact resistance, sliding properties, appearance, etc.

**CONSTITUTION:** A thermoplastic resin composition consisting essentially of (A) 1-99wt.% hydrogenated rubber-based thermoplastic resin prepared by carrying out graft copolymerization of (A2) a vinylic monomer (preferably styrene or acrylonitrile) in the presence of (A1) a hydrogenated diene-based polymer obtained by hydrogenating a block copolymer and/or a random copolymer composed of an aromatic vinyl compound and a conjugated diene and (B) 99-1wt.% polyorganosiloxane-based thermoplastic resin prepared by performing graft copolymerization of (B2) a vinylic monomer in the presence of (B1) a modified polyorganosiloxane obtained by cocondensing an organosiloxane with 0.1-50wt.% graft crosslinking agent.

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**RUBBER LAMINATE**

Patent number: JP3197135  
Publication date: 1991-08-28  
Inventor: OTA KOJI; others: 03  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD; others: 01  
Classification:  
- international: B32B25/04  
- european:  
Application number: JP19890339492 19891227  
Priority number(s):

**Abstract of JP3197135**

**PURPOSE:** To obtain a laminate wherein silicon rubber and organic rubber having an excellent heat resistance, cold resistance, and weatherability are bonded firmly to each other by superimposing and vulcanizing an unvulcanized rubber layer containing silicone rubber and an unvulcanized rubber layer containing organic rubber, and blending specific organopolysiloxane on the one layer in a specific quantity.

**CONSTITUTION:** The rubber laminate is a laminate wherein an unvulcanized rubber layer A containing silicone rubber and an unvulcanized rubber layer B containing organic rubber are superimposed and vulcanized. On the one layer, 3 - 500 of polymerization degree of organopolysiloxane C shown by an average unit formula I is blended at 0.1 - 20pts.wt. relative to 100pts.wt. of rubber. When the addition quantity of organopolysiloxane is too less, sufficient adhesion can not be obtained, on the contrary, it is too much, the characteristics of the silicone rubber and organic rubber are damaged. The layer containing the silicone rubber and the layer containing the organic rubber are bonded firmly by vulcanization without using any intermediate layer or adhesive agent. In the formula, R shows a substituted or non-substituted monovalent hydrocarbon radical, and 5 - 50mol.% in R is a vinyl group, and (a) denotes a number of  $0 < a < 4$ .

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**COATING MATERIAL**

Patent number: JP3207774  
Publication date: 1991-09-11  
Inventor: SHIMIZU TOMONOBU; others: 02  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- International: C09D163/00; C08G59/14; C09D183/04; C09D183/06  
- european:  
Application number: JP19900001602 19900110  
Priority number(s):

**Abstract of JP3207774**

**PURPOSE:** To obtain the title material having excellent alkali resistance and flexibility of coating film without impairing heat resistance, hardness and weather resistance which an organopolysiloxane has by compositing epoxy resin and organopolysiloxane at a specific ratio.

**CONSTITUTION:** The aimed material containing a compound obtained by reacting (A) 10-90wt.% reaction product of epoxy resin having at least two epoxy in one molecule and organosilicon compound expressed by formula I (x is organic group having active hydrogen; R<1> is 1-6C bivalent hydrocarbon; R<2> to R<3> are 1-7C monovalent hydrocarbon; a is 0-2) with (B) 10-90wt.% organopolysiloxane obtained by hydrolyzing and condensing an organotrialkoxy silane expressed by formula II (R4 is 1-8C monovalent organic group; R5 is 1-7C monovalent hydrocarbon).

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**THERMOPLASTIC RESIN COMPOSITION**

Patent number: JP3252446  
Publication date: 1991-11-11  
Inventor: SUZUKI YOSHINOBU; others: 01  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- international: C08L65/00; C08K5/10; C08K5/20; C08L21/00;  
C08L83/02  
- european:  
Application number: JP19900049214 19900302  
Priority number(s):

**Abstract of JP3252446**

**PURPOSE:** To obtain the subject composition excellent in heat resistance, impact resistance and moldability and suitable for exterior automotive members, etc., by blending a hydrogenated polymer induced from a monomer consisting of a norbornene derivative having a polar substituent with a rubbery polymer and/or a rubber-reinforced resin, etc.

**CONSTITUTION:** With (A) 5-95wt.% hydrogenated polymer prepared by carrying out ring opening polymerization of a monomer consisting of a norbornene derivative represented by formula I (A and B are H or 1-10C hydrocarbon; X and Y are H, halogen, etc.; m is 0 or 1) or of the above-mentioned monomer and a copolymerizable monomer and then hydrogenating the resultant ring-opened polymer, (B) 95-5wt.% rubbery polymer and/or rubber-reinforced thermoplastic resin is blended. With 100 pts.wt. above obtained mixture, (C) 0.001-10 pts.wt. one or more compounds selected from (C1): a higher fatty acid amide represented by formula II or III (R<1>, R<3> and R<4> are 8-18C alkyl; R<2> is H, etc.; r is 1 or 2), (C2): a hydrogenated fatty glyceride and (C3): a polysiloxane are blended.

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## PREPARATION OF RUBBER-MODIFIED THERMOPLASTIC RESIN COMPOSITION

Patent number: JP53124561  
Publication date: 1978-10-31  
Inventor: NAGATA MASAKI; others: 02  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- international: C08L55/02; C08J3/20; C08L51/06  
- european:  
Application number: JP19770038542 19770406  
Priority number(s):

### Abstract of JP53124561

PURPOSE: To prepare a resin composition having improved impact resistance, gloss, etc., by adding liquid paraffin and/or a polysiloxane to the solution of a rubbermodified thermoplastic resin, thereafter recovering the polymer.

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**PRODUCTION OF BLOCK COPOLYMER**

Patent number: JP56000828  
Publication date: 1981-01-07  
Inventor: SUMINOE TARO; others: 03  
Applicant: JAPAN SYNTHETIC RUBBER CO LTD  
Classification:  
- international: C08G77/42  
- european:  
Application number: JP19790074642 19790615  
Priority number(s):

**Abstract of JP56000828**

**PURPOSE:** To obtain a silicone resin having flexibility and excellent heat resistance and adhesion to inorganic materials, by reacting methylpolysiloxane with a specific silicon compound in the presence of an amine and an organic solvent.

**CONSTITUTION:** Methylpolysiloxane represented by formula I is reacted with a silicon compound represented by formula II, wherein R and R' are alkyl or aryl, X is chlorine, amino or alkoxy, m is 0-100 and 1 is 2-10, in the presence of an amine and an organic solvent. Examples of said amine which can be preferably used include pyridine and triethylamine. Examples of the organic solvent include benzene, chloroform, diethyl ether and acetone. As the compounds represented by formula deg.C, those having the formula in which 1 is 2-5 and m is about 0-20 are preferred.

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**THIN FILM-FORMING COATING LIQUID COMPOSITION**

**Patent number:** JP56129261  
**Publication date:** 1981-10-09  
**Inventor:** NAKATANI MITSUO; others: 07  
**Applicant:** HITACHI LTD; others: 01  
**Classification:**  
- **International:** C09D3/16; C08L83/04  
- **European:**  
**Application number:** JP19800032735 19800317  
**Priority number(s):**

**Abstract of JP56129261**

**PURPOSE:** To provide the titled compsn. which produces a good coating film which has a uniform thickness and is pinhole-free, and is suitable for use in the production of an insulating coating film, an oriented film, etc., by adding a specified amount of dimethylpolysiloxane to a soln. consisting of a ladder type organosilicon polymer and a solvent.

**CONSTITUTION:** 0.01-10wt% Dimethylpolysiloxane (C) is blended with a soln. consisting of 0.5-20wt% ladder type organosilicon polymer (A) having phenyl group [e.g. a polyphenylsilsesquioxane having a relative viscosity (in 1wt% benzene soln. at 30 deg.C) of 1.1-3.0] and 99.5-80wt% solvent (B) having a b.p. of not lower than 180 deg.C. By the blending of dimethylpolysiloxane, a coating film which is pinhole-free and has a uniform thickness, can be obtd. when the compsn is coated on the surfaces of glass, SiO<sub>x</sub> and metal oxides by printing method.

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**ENHANCEMENT OF HEAT RESISTANCE OF POLYPHENYLSILSESQUIOXANE**

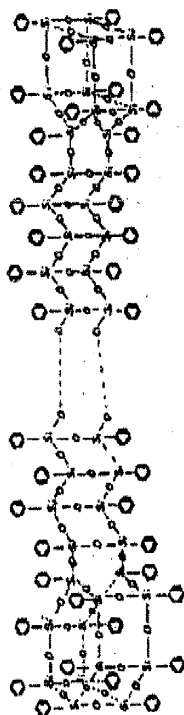
Patent number: JP56139533  
Publication date: 1981-10-31  
Inventor: EGUCHI KINYA; others: 01  
Applicant: HITACHI LTD  
Classification:  
- International: C08G77/34  
- european:  
Application number: JP19800042841 19800403  
Priority number(s):

**Abstract of JP56139533**

**PURPOSE:** To obtain a polyphenylsilsesquioxane with excellent heat resistance, by depositing a polymer of specified MW from a solution of a polyphenylsilsesquioxane widely ranging in MW distribution.

**CONSTITUTION:** A polyphenylsilsesquioxane of the formula widely ranging in MW distribution is dissolved in an org. solvent (e.g., benzene or methylene chloride). The resulting solution is filtered after a polymer of MW  $\geq 100,000$  is selectively deposited as a precipitate by the addition of acetone, to obtain a polyphenylsilsesquioxane with high heat resistance.

**USE:** A material for the tip-coating membrane of a semiconductor device sealed with a ceramic.



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**ABRASIVE MATERIAL**

Patent number: JP57008279  
Publication date: 1982-01-16  
Inventor: TOMOYOSE KAGEYUKI; others: 02  
Applicant: KONISHIROKU PHOTO IND CO LTD  
Classification:  
- international: C09K3/14; G03G21/00  
- european:  
Application number: JP19800080901 19800617  
Priority number(s):

**Abstract of JP57008279**

**PURPOSE:**An abrasive material capable of easy abrading, effectively abrading the surface of a body to be abraded and simultaneously accomplishing mirror polishing for said surface, which comprises a specified org. solid abrasive grain.

**CONSTITUTION:**A polysilsesquioxane such as a polysiloxane having a three-dimensional crosslinking structure of the formula (wherein R is ethyl, propyl, butyl, methoxy, ethoxy, propoxy, butoxy, aryl or aralkyl), pref. one of particle size  $\geq$  about 7 $\mu$ , is used as an org. solid abrasive grain. An inorg. solid abrasive grain such as carborundum or an emery abrasive grain of particle size  $\leq$  about 5 $\mu$ . may be used together.

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**FILM-FORMING RESIN COMPOSITION**

Patent number: JP57038865  
Publication date: 1982-03-03  
Inventor: TAKEDA SHIRO; others: 02  
Applicant: FUJITSU LTD  
Classification:  
- international: C09D3/82; C08L83/04  
- european:  
Application number: JP19800113952 19800821  
Priority number(s):

**Abstract of JP57038865**

**PURPOSE:** To provide a resin compsn. which makes thick coating possible and forms a coating film having excellent heat resistance, by mixing an inorg. powder with a silicon resin composed of polysilsesquioxane and polyorganosilane.

**CONSTITUTION:** 5-300pts.wt. inorg. powder is mixed with 100pts.wt. silicone resin composed of polysilsesquioxane and polyorganosilane. By mixing the inorg. powder such as particulate or needle alpha-iron oxide, magnetite or alpha-alumina powder having an average particle size of 2µm or smaller, thick coating becomes possible, a coating film having excellent heat resistance can be formed and crack is not formed.

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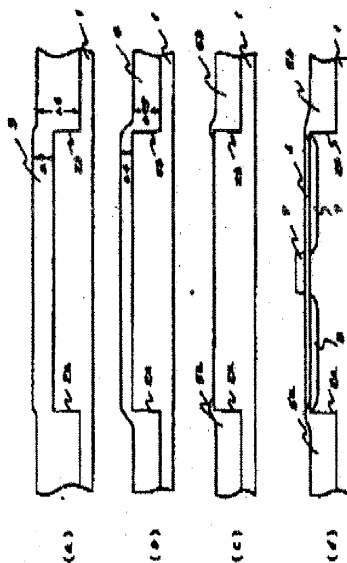
**MANUFACTURE OF SEMICONDUCTOR DEVICE**

Patent number: JP57112047  
Publication date: 1982-07-12  
Inventor: NAKASHIMA MINORU; others: 06  
Applicant: FUJITSU KK  
Classification:  
- International: H01L21/76; H01L21/312; H01L21/95  
- european:  
Application number: JP19800187288 19801229  
Priority number(s):

**Abstract of JP57112047**

**PURPOSE:** To obtain precise insulating isolation of fine size by a method wherein when insulating isolation is performed in a semiconductor substrate a groove is formed in an isolation region in the first place, and over all surface organic oxyasilan and/or its polymer is extended by flowing with the groove filled, and by heat-treatment thermally stable silicon oxide is produced.

**CONSTITUTION:** On the surface of a p type Si substrate 1, grooves 2a and 2b which are to be isolation grooves are dug by ion-etching using an electron ray resist, and over all surface containing them a solution of an organic solvent consisting of polymethylsiloxane is applied and heated at 120 deg.C in 1hr, and polymer 3 is formed by removing the solvent. Next by heating at 900 deg.C in 1hr, volume of polymer 3 is decreased and a silicon oxide 4 is formed, and through plasma etching using CF<sub>4</sub> family gas, to oxide 4 except grooved region is removed, and filled layers 5a and 5b consisting of the oxide 4 are left unremoved solely the grooves 2a and 2b. Subsequently in a substrate 1 surrounded by them as the conventional method, an n type source region 8 and a drain 9 are provided.



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**OPTICAL FIBER**

Patent number: JP57125905  
Publication date: 1982-08-05  
Inventor: TAKEDA SHIROU; others: 04  
Applicant: FUJITSU KK  
Classification:  
- International: G02B5/14  
- european:  
Application number: JP19810012552 19810130  
Priority number(s):

**Abstract of JP57125905**

**PURPOSE:** To reduce propagation losses by coating polysilsesquioxane or mixed resins consisting essentially of this on glass fiber surfaces thereby improving the adhesive strength of a connector resin in the stage of connecting fibers by stripping the jacket resin on this coating.

**CONSTITUTION:** A polymer cladding optical fiber coated with polysilsesquioxane or mixed resins of this and polydimethylsiloxane on the surface of a quartz core is made by using nylon resin or the like as its jacket layer. The leading end part of the jacket layer of such optical fiber is stripped, and a connector is formed with an epoxy resin molding material. Two pieces of such connectors are joined, whereby the connector of low propagation losses, good adhesion of the glass and the molding material and high performance and reliability is obtained.

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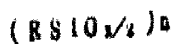
# SILICONE RESIN COMPOSITION

Patent number: JP57131250  
 Publication date: 1982-08-14  
 Inventor: TAKEDA SHIROU; others: 02  
 Applicant: FUJITSU KK  
 Classification:  
 - International: C08L83/04; H01B3/46; H01C17/02; H01L21/312;  
 H01L21/88; H01L23/30  
 - european:  
 Application number: JP19810017715 19810209  
 Priority number(s):

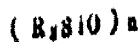
## Abstract of JP57131250

PURPOSE: To provide a silicone resin compsn. which has excellent heat resistance, adhesion, etc., is capable of thick-wall coating, and suitable for use in the coating of electronic parts, by linking polysilsesquioxane with a single chain polysiloxane to an appropriate crosslinkage density.

CONSTITUTION: 50-97pts.wt. polysilsesquioxane (A) of formula I (wherein R is a monovalent hydrocarbon group) is mixed with 50-3pts.wt. single-chain polysiloxane (B) of formula II wherein R2 is a hydrocarbon group. The mixture is reacted at 350 deg.C or lower to bond polysilsesquioxane component to each other through the single chain polysiloxane, whereby softness is given to the entire product, thermal decomposition of said single-chain polysiloxane is inhibited and the desired silicone resin compsn. can be obtd. In this way, unfavorable rigidity of component A and poor heat resistance of component B are compensated. There can be obtd. a silicone resin compsn. having excellent heat resistance which component A possesses and softness which component B possesses.



I



II

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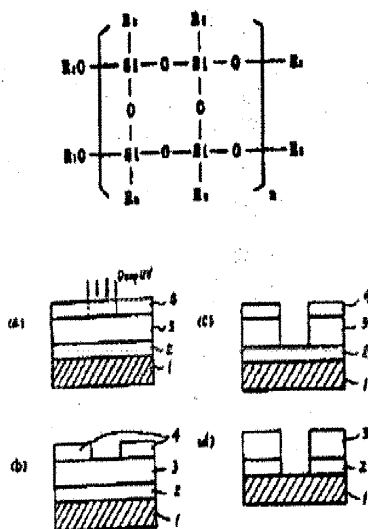
## FORMATION OF PATTERN

Patent number: JP57141642  
 Publication date: 1982-09-02  
 Inventor: YONEDA YASUHIRO; others: 03  
 Applicant: FUJITSU KK  
 Classification:  
 - International: G03C1/72; G03F1/00; H01L21/30  
 - european:  
 Application number: JP19810027482 19810226  
 Priority number(s):

## Abstract of JP57141642

PURPOSE: To easily dry etch a layer to be worked by using a resist material prepared by adding a specified polysilsesquioxane to a resist for ultraviolet rays.

CONSTITUTION: A substrate 1 having a formed layer 2 of SiO<sub>2</sub> or the like to be worked is successively coated with the 1st resist layer 3 of polystyrene or the like with high etching resistance and the 2nd resist layer 4 consisting of a polysilsesquioxane represented by the formula (where n is the degree of polymn; R<sub>1</sub> is H, 1-4C alkyl, phenyl or CN; R<sub>2</sub> is phenyl, 1-4C alkyl or CN) and a resist for ultraviolet rays. The layer 4 alone is exposed and developed, and the disclosed part of the layer 3 is removed by etching in oxygen plasma to form a pattern. The disclosed part of the layer 2 is then removed by etching with an etchant to pattern the layer 2.



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## FORMATION OF NEGATIVE PATTERN

Patent number: JP57168246

Publication date: 1982-10-16

Inventor: YONEDA YASUHIRO; others: 03

Applicant: FUJITSU KK

Classification:

- international: G03C5/00; G03C1/71; G03F7/00; G03F7/10;  
H01L21/302

- european:

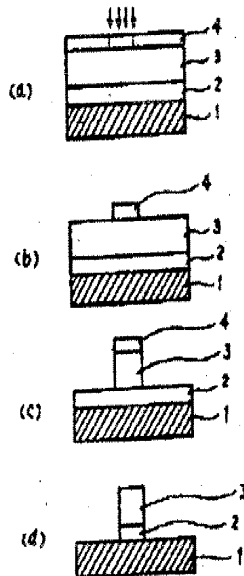
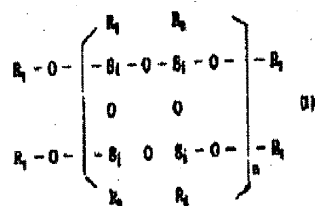
Application number: JP19810053300 19810409

Priority number(s):

## Abstract of JP57168246

**PURPOSE:** To enhance the dry etching resistance without reducing the sensitivity by using an ionized radiation resist having a 2-layered structure whose upper layer contains polysilsesquioxane.

**CONSTITUTION:** A substrate 1 is successively coated with a layer 2 of Al, Al alloy, SiO<sub>2</sub> or the like to be worked, the 1st resist layer 3 of polystyrene or phenol resin etchable with oxygen plasma and having high dry etching resistance, and the 2nd resist layer 4 made of mixture of a negative type resista material with polysilsesquioxane represented by formula 1 (where n is polymn. degree, R<sub>1</sub> is H or >=1 kind of group selected from phenyl, 1-4C alkyl and CN, and R<sub>2</sub> is >=1 kind of group selected from phenyl, 1-4C alkyl and CN). By irradiating ionized radiation such as electron beams or X-rays, only the resist layer 4 is exposed, and it is developed. The disclosed part of the resist layer 3 is then removed by etching with oxygen plasma, and the layer 2 to be worked is patterned by etching with an etchant.



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## FORMATION OF NEGATIVE PATTERN

Patent number: JP57168247

Publication date: 1982-10-16

Inventor: YONEDA YASUHIRO; others: 05

Applicant: FUJITSU KK

Classification:

- International: G03C5/00; G03C1/71; G03F7/00; G03F7/10;  
H01L21/302

- european:

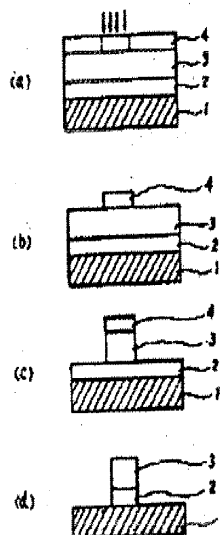
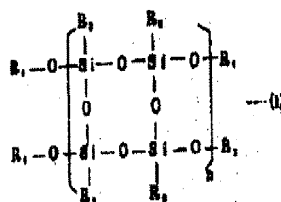
Application number: JP19810053306 19810409

Priority number(s):

## Abstract of JP57168247

**PURPOSE:** To enhance the dry etching resistance by using an ionized radiation resist having a 2-layered structure contg. a polysilsesquioxane layer as the upper layer.

**CONSTITUTION:** A substrate 1 is successively coated with a layer 2 of Al, Al alloy, SiO<sub>2</sub> or the like to be worked, the 1st resist layer 3 of polystyrene, polyvinylcarbazole or phenolresin etchable with oxygen plasma and having high dry etching resistance, and the 2nd resist layer 4 made of polysilsesquioxane represented by formula 1 (where n is polymn. degree, R<sub>1</sub> is H or >=1 kind of group selected from phenyl, 1-4C alkyl and CN, and R<sub>2</sub> is >=1 kind of group selected from phenyl, 1-4C alkyl and CN). By irradiating ionized radiation such as electron beams, X-rays or ion beams, only the resist layer 4 is exposed, and it is developed. The disclosed part of the resist layer 3 is then removed by etching with oxygen plasma, and the layer 2 to be worked is patterned by etching with an etchant.



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**RADICAL ADHESIVE COMPOSITION**

Patent number: JP58173174  
Publication date: 1983-10-12  
Inventor: NISHIWAKI ISAO; others: 02  
Applicant: NIPPON GOSEI GOMU KK  
Classification:  
- international: C09J3/14; C09J3/16  
- european:  
Application number: JP19820056031 19820406  
Priority number(s):

**Abstract of JP58173174**

**PURPOSE:** To provide the titled adhesive excellent in adhesion and heat, chemical, and water resistance, curable quickly at room temp., by incorporating a terminal functional polyorganosiloxane, specified compd. org. peroxide, and kicker.

**CONSTITUTION:** 0.1-20pts.wt. org. peroxide only or the addn. thereto of a total of 100pts.wt. of 10-90pts.wt. terminal functional polyorganosiloxane of formula I (wherein X is addn.-polymerizable unsatd. group such as 2-10C vinyl or isopropenyl, or functional group contg. these; R is 1-10C hydrocarbon group; n is a number-average bonding number of skeleton of formula II in polysiloxane mixture, 1-200) and/or 10-90pts.wt. compd. having two or more addn.-polymerizable unsatd. group in the molecule such as vinyl or isopropenyl and no siloxane bonding is defined as component A. 0.1-30pts.wt. kicker of said org. peroxide only or the addn. thereto of said polyorganosiloxane and/or said unsatd. group-contg. compd. is defined as component B. Components A and B are mixed together for curing.

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**TWO-PACKE TYPE ADHESIVE COMPOSITION**

Patent number: JP58174480  
Publication date: 1983-10-13  
Inventor: NISHIWAKI ISAO; others: 02  
Applicant: NIPPON GOSEI GOMU KK  
Classification:  
- international: C09J3/16  
- european:  
Application number: JP19820056610 19820407  
Priority number(s):

**Abstract of JP58174480**

**PURPOSE:** A nonsolvent-type adhesive composition that is composed of two components of a polyorganosiloxane with functional groups on chain terminals, thus showing high adhesion, heat resistance, chemical resistance and water resistance.

**CONSTITUTION:** The objective two-component composition comprises (A) a polyorganosiloxane or formula I or II (X is hydroxyl, mercapto, amino, isocyanate, epoxy, glycidyl, aziridinyl, hydroxyl, mercapto, amino and/or carboxyl; R<1> is 1-20 hydrocarbon; R<2> is 1-10 hydrocarbon; n is average bond number of polysiloxane mixture in formula III, 0-200) and (B) a polyfunctional compound free from siloxane bonds having a plurality of isocyanate, epoxy, aziridinyl, hydroxyl, mercapto, amino and/or carboxyl functional groups.





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## COATING RESIN SOLUTION AND PRODUCTION THEREOF

Patent number: JP59109565  
Publication date: 1984-06-25  
Inventor: TAKEDA SHIROU; others: 01  
Applicant: FUJITSU KK  
Classification:  
- international: C09D3/82; H01L21/312; H01L21/88  
- european:  
Application number: JP19820219174 19821216  
Priority number(s):

## Also published as:

 EP0112168 (A2)  
 US4510283 (A1)  
 EP0112168 (A3)  
 EP0112168 (B1)

## Abstract of JP59109565

PURPOSE: To provide the titled resin soln. which has good shelf stability and can form a uniform coating film by spin coating, by dissolving a specified polycondensate of a hydrolyzed alkoxysilane and a polysilsesquioxane prepolymer in an org. solvent.

CONSTITUTION: 30-60pts.wt. (on a solid basis) soln. (A) of a polycondensate of a hydrolyzed tetramethoxy (or ethoxy) silane having a weight-average MW of 1,000-6,000 and 70-40pts.wt. polysilsesquioxane prepolymer (B) which has a weight-average MW of 2,500-7,000 and in which org. groups directly attached to silicon atoms are phenyl, methyl, ethyl and vinyl groups (with the proviso that 5-50mol% thereof is the phenyl group), are dissolved in an org. solvent (C) having a b.p. of 110 deg.C or above under atmospheric or subatmospheric pressure (e.g. methyl cellosolve acetate or methyl ethyl ketone), followed by treating at 5mm.Hg or below to obtain a coating resin soln. contg. solid at a concn. of 20-50wt%, which is suitable for use as an insulating material for wires.

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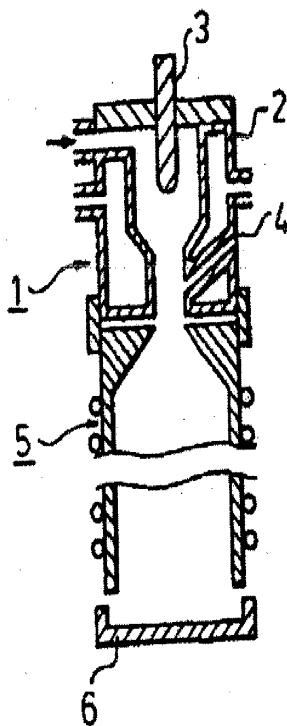
## PREPARATION OF COLUMN PACKING SUBSTANCE FOR GASCHROMATOGRAPHY

Patent number: JP59112834  
Publication date: 1984-06-29  
Inventor: KITAKOUJI TOSHISUKE; others: 03  
Applicant: FUJITSU KK  
Classification:  
- International: B01J20/26; G01N31/08  
- european:  
Application number: JP19820220332 19821217  
Priority number(s):

### Abstract of JP59112834

**PURPOSE:** To continuously and homogeneously obtain substance, by a method wherein a silicone type packing material is continuously supplied to a plasma jet under atmospheric pressure to rapidly and homogeneously modify the surface of the packing material.

**CONSTITUTION:** A plasma jet apparatus consists of a plasma jet generating gun 1 and a granulation cylinder 5 and the gun 1 is constituted by arranging a W- anode 3 in a water cooled cylindrical copper cathode 2 to inject operation gas such as A from the orifice thereof while forming the same into gaseous plasma. The granulation cylinder 5 is a water cooled cylinder and receiving tray 6 is arranged below said cylinder 5. That is, a silicone type packing material such as fixed phase carrier diatomaceous earth is continuously supplied into a plasma jet at atmospheric pressure from an introduction port 4 and the plasma jet is continuously and instantaneously acted on said material to enable the instantaneous dehydration of a silanol group while enabling the homogeneous formation of a siloxane group and packing substance is formed in high forming speed.



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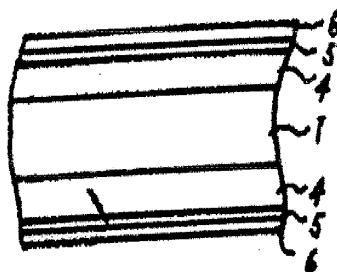
**MAGNETIC DISK**

Patent number: JP59132424  
Publication date: 1984-07-30  
Inventor: TAKEDA SHIROU; others: 01  
Applicant: FUJITSU KK  
Classification:  
- International: G11B5/82; G11B5/72  
- european:  
Application number: JP19830007048 19830119  
Priority number(s):

**Abstract of JP59132424**

**PURPOSE:** To smoothen the substrate of a disk, to relieve impact force to a magnetic head, and to prevent the crushing of the head by successively forming a polyimide layer, a silicone resin layer and a magnetic iron oxide layer on each side of an Al substrate.

**CONSTITUTION:** Polyimide is coated on each side of a doughnut-shaped Al plate of 14 in. diameter by a rotary coating method, the polyimide is dried by evaporating the solvent, and it is baked to form a polyimide layer of 10μm thickness. Polymethylsilsesquioxane prepolymerized by polymerizing trifunctional silane is similarly coated on the polyimide layer, and it is cured to form a silicone resin layer of 0.2μm thickness. A gamma-Fe<sub>2</sub>O<sub>3</sub> layer is formed on the silicone resin layer by subjecting an alpha-Fe<sub>2</sub>O<sub>3</sub> layer to reduction and oxidation by sputtering in Ar. An SiO<sub>2</sub> layer of 0.02μm thickness is further formed by sputtering, and a lubricant is applied to obtain a magnetic disk.



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**PRODUCTION OF POLYDIHYDROGENSILOXANE**

Patent number: JP59189126  
Publication date: 1984-10-26  
Inventor: NISHII KOUTA; others: 01  
Applicant: FUJITSU KK  
Classification:  
- international: C08G77/12; C08G77/06  
- european:  
Application number: JP19830064735 19830413  
Priority number(s):

**Abstract of JP59189126**

**PURPOSE:** To obtain stable polydihydrogensiloxane, by substituting carboxyl groups for the chloro groups in dichlorosilane and esterifying the product by the addition of an alcohol.

**CONSTITUTION:** Dichlorosilane ( $\text{H}_2\text{SiCl}_2$ ) gas is fed to a carboxylic acid solution kept at a low temperature to substitute the carboxyl groups for the chloro groups in dichlorosilane. An alcohol is added to the solution containing the substitution product to effect an esterification reaction and a polycondensation reaction of the silanol to obtain polydihydrogensiloxane. In this way, it becomes possible to obtain polydihydrogensiloxane in a stable form, which is unstable, otherwise, and to employ it as spacing elements of a semiconductor integrated circuit.

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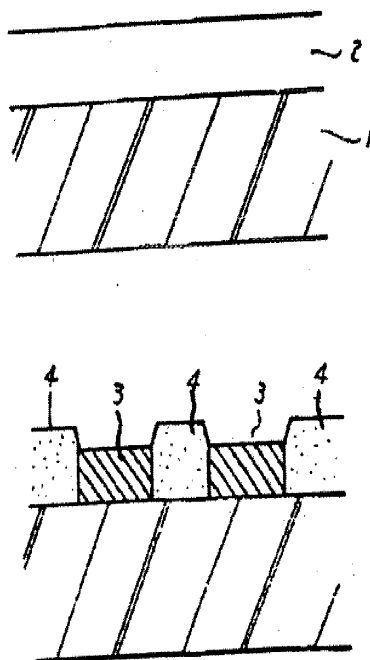
# MANUFACTURE OF THIN SILICON OXIDE FILM SUBSTRATE HAVING MINUTE HOLLOWS AND PROTRUSIONS

Patent number: JP59190211  
Publication date: 1984-10-29  
Inventor: TAKEDA SHIROU; others: 02  
Applicant: FUJITSU KK  
Classification:  
- International: C01B33/113; G03C1/74; G03F7/16; G11B7/26  
- european:  
Application number: JP19830064736 19830413  
Priority number(s):

## Abstract of JP59190211

**PURPOSE:** To produce a silicon oxide film having minute hollows and protrusions, stably, by selectively irradiating a flat substrate coated with polysiloxane hydride with laser beam in an oxygen-free atmosphere to cause the thermal decomposition of the coating film, and heating the substrate in an oxidative atmosphere.

**CONSTITUTION:** In the preparation of a thin film substrate for optical disk, a polished flat glass substrate 1 is coated with a toluene solution of polysiloxane hydride, and heated to evaporate toluene and form a thin film 2. The film is irradiated with argon laser beam to write optical information. The irradiated part 3 is thermally decomposed to  $\text{SiO}$  by this process, and reduces its thickness. The substrate 1 is heated in an oxygen atmosphere to convert the non-irradiated part 4 to  $\text{SiO}_2$ . There occurs little change in the thickness of the non-irradiated part 4 by this procedure. A substrate 1 of silicon oxide thin film having minute hollows and protrusions corresponding to the presence and absence of laser beam radiation, can be produced by this method.



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**PRODUCTION OF POLYDIHYDROGENSILOXANE**

Patent number: JP60042426  
Publication date: 1985-03-06  
Inventor: NISHII KOUTA; others: 01  
Applicant: FUJITSU KK  
Classification:  
- international: C08G77/12; C08G77/06  
- european:  
Application number: JP19830150367 19830819  
Priority number(s):

**Abstract of JP60042426**

**PURPOSE:** To obtain a silane-terminated polydihydrogensiloxane without gelation, etc., by dissolving a dialkoxysilane in hydrous methyl isobutyl ketone, hydrolyzing it, and effecting the polycondensation of the hydrolyzate by dehydration in vacuum.

**CONSTITUTION:** A dialkoxysilane of the formula:  $H_2Si(OR)_2$  (wherein R is a monovalent lower alkyl) is dissolved in methyl isobutyl ketone containing water in an amount in the range not to cause separation between water and organic phases. A steam-containing inert gas is bubbled into the solution to hydrolyze the silane, and the hydrolyzate is polycondensed by dehydration in vacuum to obtain the purpose silanol-terminated poly(dihydrogensiloxane). In this way, it becomes possible to control the reaction rate of the hydrolysis, to effect the hydrolysis and polycondensation of a dialkoxysilane without three-dimensional crosslinking and to obtain poly(dihydrogensiloxane) suitable for insulation films of semiconductor devices.

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**EPOXY RESIN COMPOSITION**

Patent number: JP60076528  
Publication date: 1985-05-01  
Inventor: SATOU SHIGEYUKI; others: 01  
Applicant: TOYODA CHUO KENKYUSHO KK  
Classification:  
- international: C08G59/18; C08K5/54; C08L63/00; H01L23/30  
- european:  
Application number: JP19830185537 19831003  
Priority number(s):

**Abstract of JP60076528**

**PURPOSE:**The titled composition, consisting of an epoxy resin, a curing agent and an additive consisting of an alkylarylsilsesquioxane based silicone compound expressed by a specific formula and sorbitan ester of a fatty acid etc., and having improved moisture resistance and rust preventing property.

**CONSTITUTION:**An epoxy resin composition obtained by incorporating an epoxy resin, e.g. phenolic novolak based epoxy resin, with a curing agent, e.g. phenolic resin, and an additive consisting of either one or both of an alkylarylsilsesquioxane based silicone compound expressed by formula I (R1-R6 are alkyl, aryl, alkenyl or aralkyl) and sorbitan ester of a fatty acid, e.g. expressed by formula II (R is lauryl, palmityl, stearyl or oleyl; X1-X3 are OH or RCOO<->) or a derivative thereof and if necessary an inorganic filler, e.g. zirconia, mixing fully them, melt kneading the resultant mixture, cooling the kneaded mixture, and pulverizing the cooled mixture.

**USE:**Sealing resins for semiconductor devices, other electronic circuit parts, etc.

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**PRODUCTION OF POLYHYDROGEN SILSESQUIOXANE**

Patent number: JP60086017  
Publication date: 1985-05-15  
Inventor: NISHII KOUTA; others: 02  
Applicant: FUJITSU KK  
Classification:  
- international: C01B33/00; C08G77/04  
- european:  
Application number: JP19830192488 19831017  
Priority number(s):

**Abstract of JP60086017**

**PURPOSE:** To obtain a polydihydrogen silsesquioxane soluble in solvents, by dissolving trichlorosilane in a solvent saturated with water, and bubbling an inert gas containing steam in the solution.

**CONSTITUTION:** Methyl isobutyl ketone is saturated with about 2 wt% water at 10 deg.C, and trichlorosilane is added slowly to the solution to obtain a reaction liquid. An inert gas such as N<sub>2</sub> is passed through hot water of 50-70 deg.C, and the resultant steam-containing inert gas is bubbled in the above reaction liquid containing trichlorosilane to effect the hydrolysis and the polycondensation of the trichlorosilane to the objective polydihydrogen silsesquioxane soluble in the solvents such as methyl isobutyl ketone.

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**RUBBER COMPOSITION**

Patent number: JP60152552  
Publication date: 1985-08-10  
Inventor: MORI YOUJI; others: 04  
Applicant: NIPPON GOSEI GOMU KK; others: 01  
Classification:  
- international: C08L33/04; C08L43/00  
- european:  
Application number: JP19840005725 19840118  
Priority number(s):

**Abstract of JP60152552**

**PURPOSE:** To provide a rubber compsn. having excellent mechanical strength and resistance to heat and low temperature, by blending a silicone rubber with an acrylic rubber contg. double bonds as the crosslinking group.

**CONSTITUTION:** 90-10pts.wt. acrylic rubber contg. double bonds as crosslinking group (e.g. acrylic rubber obtd. by copolymerizing ethylene acrylate and 0.5-20wt% ethylidene-norbornene) is blended with 10-90pts.wt. polyorganosiloxane having an average degree of polymn. of 1,000-10,000 and an average composition of the formula [wherein R<1> is a monovalent hydrocarbon group (0.02-10mol% thereof being vinyl group); a is 1.980-2.001]. Further, 3-50pts.wt. aliph. unsaturated group-contg. siloxane/acrylate ester copolymer may be added to 100pts.wt. above rubber compsn.

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**RUBBER COMPOSITION**

Patent number: JP60195148  
Publication date: 1985-10-03  
Inventor: FUNAHASHI YUJIICHI; others: 05  
Applicant: TOUSHIBA SILICONE KK; others: 01  
Classification:  
- international: C08L33/04; C08L83/07  
- european:  
Application number: JP19840050535 19840316  
Priority number(s):

**Abstract of JP60195148**

**PURPOSE:** A composition that is obtained by adding a fluorine-containing polysiloxane as a solubilizer to a base polymer of an acrylic polymer and polydiorganosiloxane, thus giving rubber-like elastomer of heat resistance, cold resistance, mechanical strength and oil resistance.

**CONSTITUTION:** (A) 100pts.wt. of the base polymer which is composed of (i) 90-100wt% of an acrylic polymer curable to give a rubber-like elastomer, preferably from acrylates and 0.1-20wt% of a crosslinking monomer, preferably a diene and (ii) 10-90wt% of polydiorganosiloxane of 1,000-10,000 average polymerization degree, bearing monovalent hydrocarbon groups as the organic groups linking to the silicon atoms, whose 0.02-5mol% is vinyl, preferably the remainings are methyls, in case of increasing cold resistance, containing 5-10mol% of phenyl groups, are combined with (B) 0.5-30pts.wt. of polysiloxane of 5-10,000 average polymerization degree, containing 15-50mol% of fluorine-containing organic groups among organic groups connecting to silicon atoms, preferably 3,3,3-trifluoropropyl.

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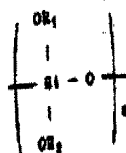
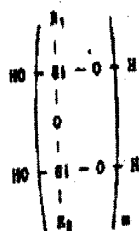
## FORMATION OF PATTERN

Patent number: JP60254034  
 Publication date: 1985-12-14  
 Inventor: NISHII KOUTA; others: 03  
 Applicant: FUJITSU KK  
 Classification:  
 - International: G03C1/71; G03F7/10; H01L21/30  
 - european:  
 Application number: JP19840108508 19840530  
 Priority number(s):

## Abstract of JP60254034

**PURPOSE:** To permit an intermediate layer to be rapidly hardened at low temp. by using a combination of organopolysilsesquioxane and a specified cross-linking agent as the intermediate layer in forming a resist pattern by using 3-layer resist films.

**CONSTITUTION:** The intermediate layer of the 3-layer resist films contains a mixture of organopolysilsesquioxane represented by formula I and polydialkoxysiloxane represented by formula II. In formulae I and II, R1 and R2 are each optionally substd. lower alkyl or optionally substd. aryl, and each may be same or different. Organopolysilsesquioxane is preferably exemplified by polymethylsilsesquioxane, and polydialkoxysiloxane is, preferably, embodied by polydiethoxysiloxane, and the cross-linking agent is, preferably, used in an amt. of 5-20wt% of organopolysilsesquioxane.



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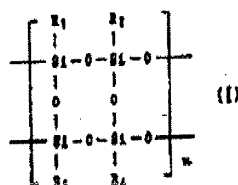
## FORMATION OF PATTERN

Patent number: JP60254035  
 Publication date: 1985-12-14  
 Inventor: YONEDA YASUHIRO; others: 03  
 Applicant: FUJITSU KK  
 Classification:  
 - International: G03C1/71; G03F7/10; H01L21/30  
 - european:  
 Application number: JP19840108518 19840530  
 Priority number(s):

## Abstract of JP60254035

**PURPOSE:** To enhance dry etching resistance without impairing sensitivity and resolution property by using 2-layer resist films composed of upper and lower layers each made of a specified substance in forming a negative type resist pattern by using ionizing radiation rays.

**CONSTITUTION:** The lower resist layer made of a material etchable with oxygen plasma and high in dry etching resistance is formed on the layer to be worked, such as a silicon wafer, and then on this layer, the upper layer made of polysilsesquioxane represented by formula (I), R1-R4 are independent of each other, each of them is phenyl, halophenyl, or halomethylphenyl, and at least one of them is halophenyl or halomethylphenyl, and n is a polymn. degree. A resist pattern is formed in the upper layer by patternwise exposing the upper layer to ionizing radiation, such as electron beams, X-rays, or ion beams, and developing it. The pattern is transferred to the lower layer by etching the lower layer by using this pattern of the upper layer as a mask. The lower layer is made of a phenol, polyimide, or polystyrene resin, or the like.



(上式において、

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> 及び R<sub>4</sub> は互いに同一もしくは異なっているとしてもよくそれぞれフェニル基、ハロゲン化フェニル基又はハロメチル化フェニル基を成し、但し、これらの基のうち少なくとも1個はハロゲン化フェニル基又はハロメチル化フェニル基であり、そして

n は重合度を表す)

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**SOLDER ALLOY FOR CONNECTOR CONTACT**

Patent number: JP61014096  
Publication date: 1986-01-22  
Inventor: HORIKOSHI EIJI; others: 03  
Applicant: FUJITSU KK  
Classification:  
- international: B23K35/26; C22C13/00  
- european:  
Application number: JP19840135404 19840629  
Priority number(s):

**Abstract of JP61014096**

**PURPOSE:** To provide improvement in the contact stability, etc. of a connector by adding specific % of silver to a solder alloy consisting of tin and indium contg. specific weight % of indium.

**CONSTITUTION:** The silver corresponding to 0.2-30% in total quantity is added to the solder alloy contg. 41-93% indium and the balance tin. The Knoop hardness of the alloy eutectic structure increases with an increase in the addition of the silver. The hardness is increased 3 times in the case of 30%. The instability of the contact between a connector pin and a solder bath occurs in the deficient hardness of the solder alloy. The hardness of the solder bath increases when 0.2-30% silver by the total weight is added thereto. The contact stability is thus improved and the contact resistance is decreased.

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